



Microsoft®  
**SQL Server® 2008**

# Section 1

Your Data, Any Place,  
Any Time

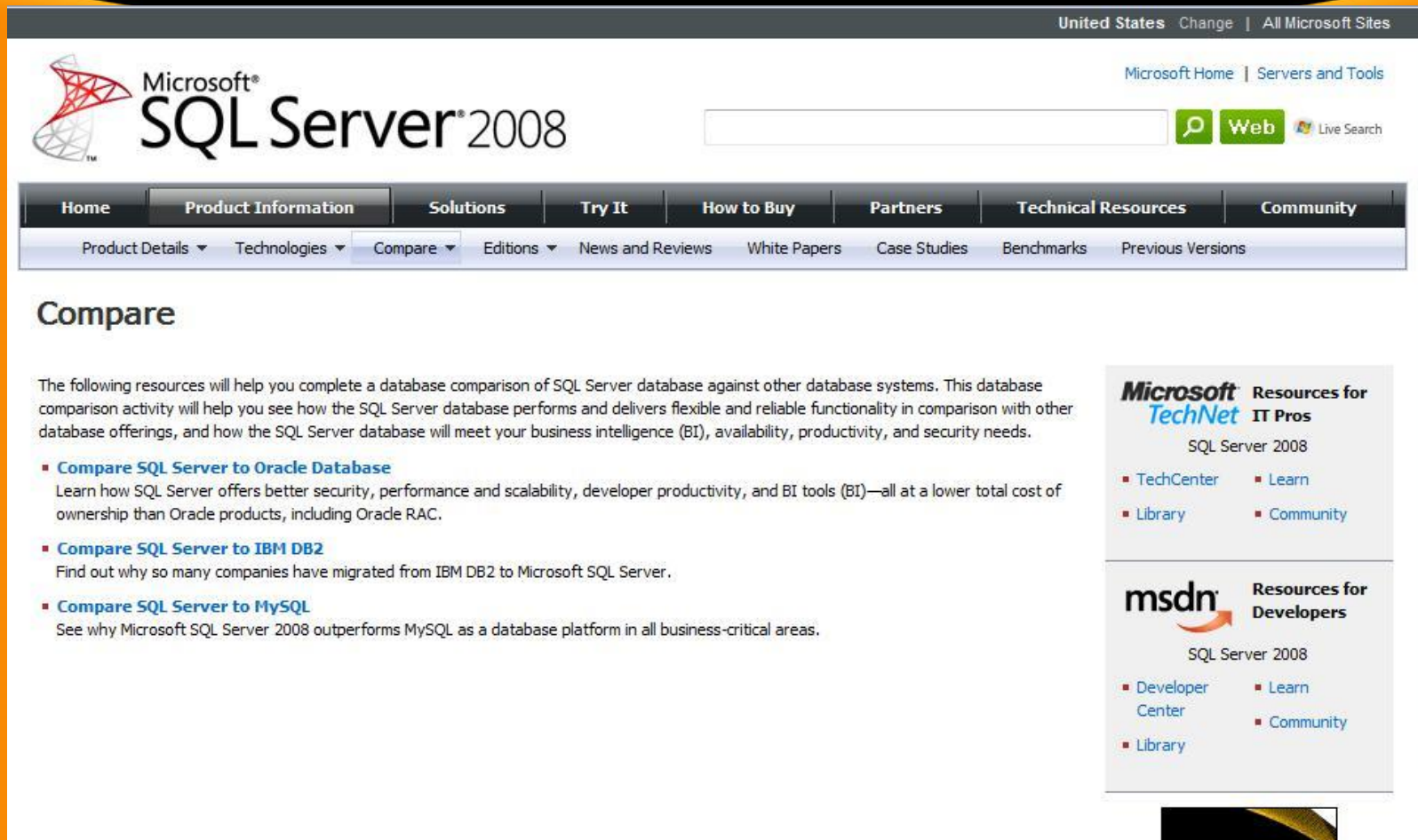
# What Is SQL Server 2008?

- ❑ Microsoft SQL Server is a [Relational Database Management System](#) (RDBMS) designed to run on platforms ranging from laptops to large multiprocessor servers.
- ❑ SQL Server is commonly used as the backend system for websites and corporate and can support thousands of concurrent users.
- ❑ SQL Server comes with a number of tools to help you with your database administration and programming tasks.
- ❑ SQL Server is much more robust and scalable than a desktop database management system such as Microsoft Access.
- ❑ Anyone who has ever tried using Access as a backend to a website will probably be familiar with the errors that were generated when too many users tried to access the database!
- ❑ Although SQL Server can also be run as a desktop database system, it is most commonly used as a [server database system](#).

# ◆ Why SQL Server?

- ❑ There are a couple of reasons why SQL Server is the best choice for a broad spectrum of end users and database programmers building business applications
- ❑ SQL Server is certainly the best system for Windows OS
  - Because of its tight integration (and low pricing)
  - Because the number of installed Windows systems is enormous and still increasing rapidly, SQL Server is a widely used system.
- ❑ Database Engine, as the relational database system component, is the easiest database system to use.
- ❑ In addition to the well-known user interface, Microsoft offers several different tools to help you create database objects, tune your database applications, and manage system administration tasks.
- ❑ Generally, SQL Server isn't only a database system.
- ❑ It is a platform that comprises Database Engine, Analysis Services, Reporting Services and Integration Services

# ◆ Comparing with other DB Engines



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Microsoft Home | Servers and Tools

Microsoft® SQL Server® 2008

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Product Details ▾ Technologies ▾ Compare ▾ Editions ▾ News and Reviews White Papers Case Studies Benchmarks Previous Versions

## Compare

The following resources will help you complete a database comparison of SQL Server database against other database systems. This database comparison activity will help you see how the SQL Server database performs and delivers flexible and reliable functionality in comparison with other database offerings, and how the SQL Server database will meet your business intelligence (BI), availability, productivity, and security needs.

- **Compare SQL Server to Oracle Database**  
Learn how SQL Server offers better security, performance and scalability, developer productivity, and BI tools (BI)—all at a lower total cost of ownership than Oracle products, including Oracle RAC.
- **Compare SQL Server to IBM DB2**  
Find out why so many companies have migrated from IBM DB2 to Microsoft SQL Server.
- **Compare SQL Server to MySQL**  
See why Microsoft SQL Server 2008 outperforms MySQL as a database platform in all business-critical areas.

**Microsoft TechNet Resources for IT Pros**  
SQL Server 2008

- TechCenter
- Library
- Learn
- Community

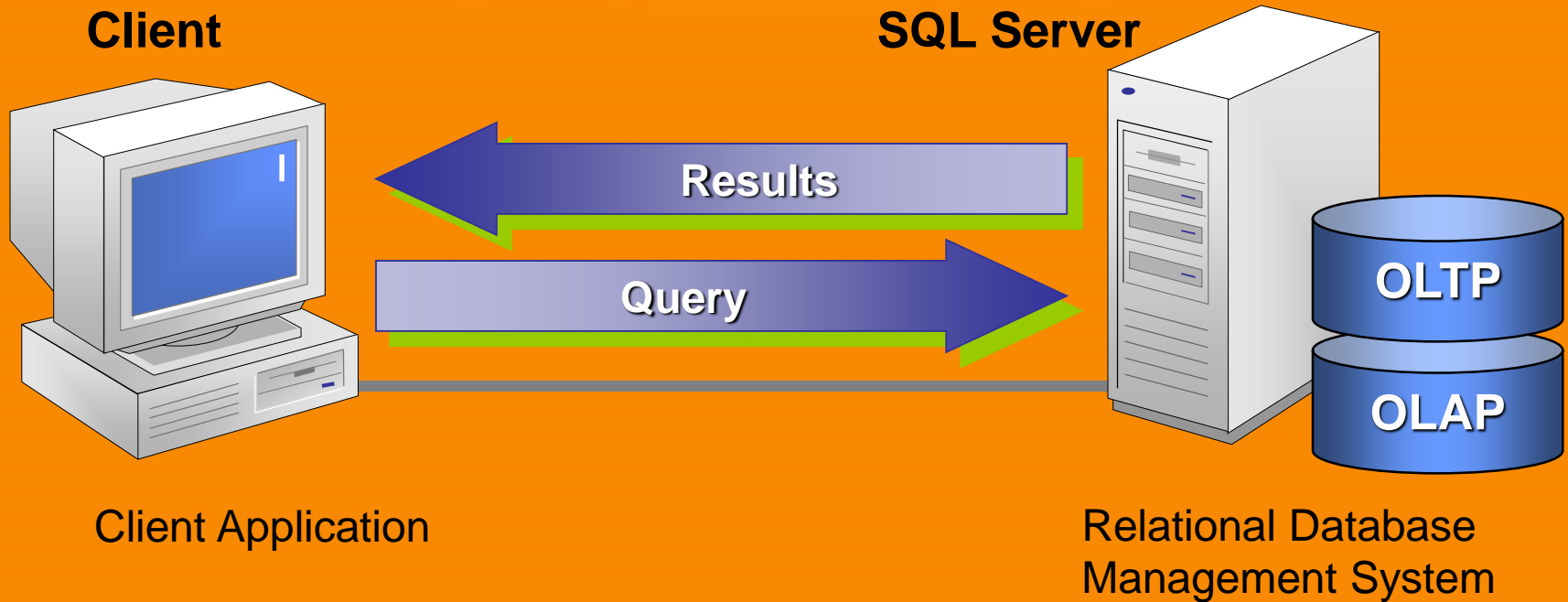
**msdn Resources for Developers**  
SQL Server 2008

- Developer Center
- Library
- Learn
- Community

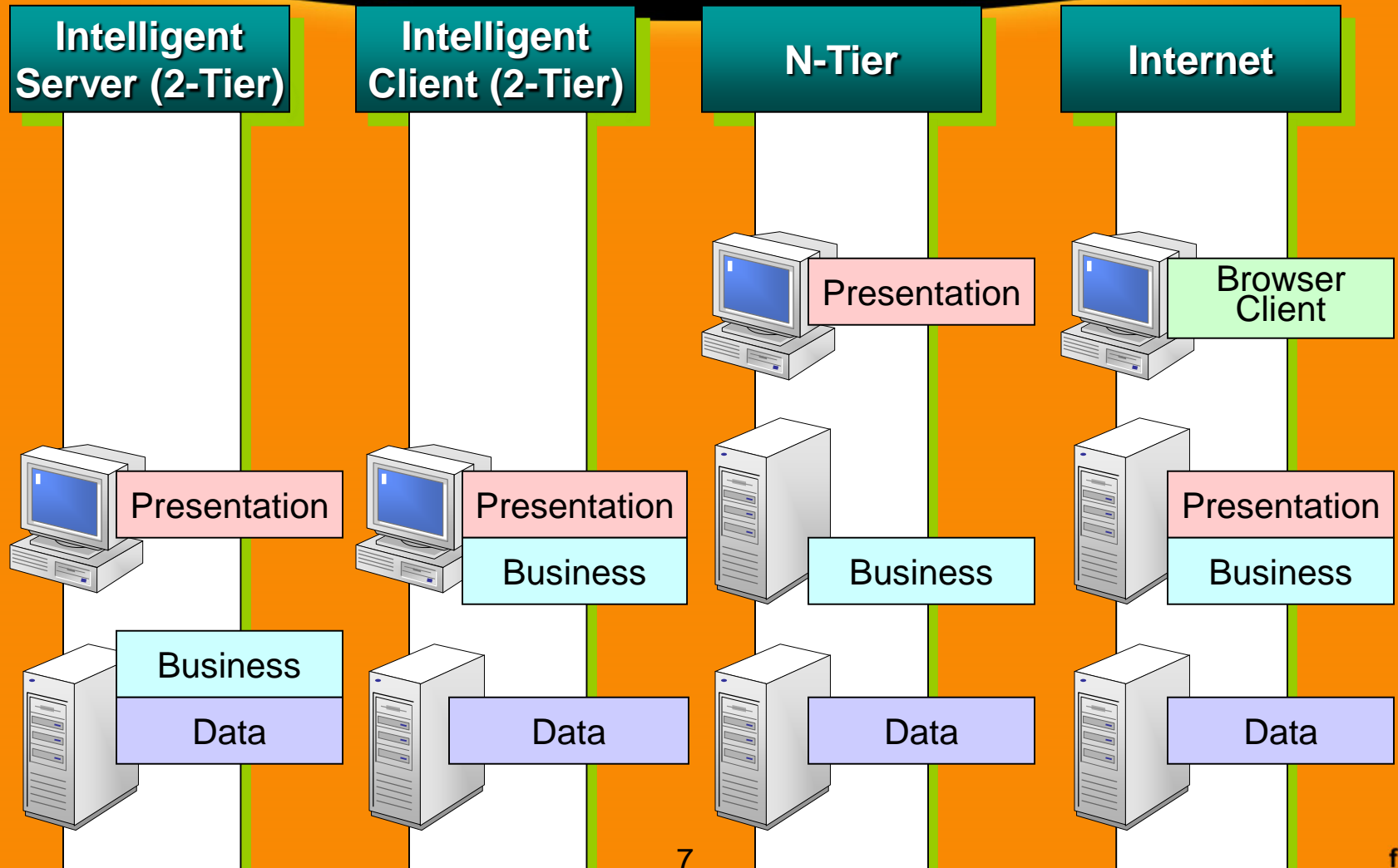
# Goals of the Course .....& Why I learn SQL Server

- ☐ Data Base developer [60%]
- ☐ Data Base administrator [35%]
- ☐ Business Intelligence developer [5%]

# Overview of Client/Server Architecture (1)



# Selecting an Application Architecture for SQL Server



# SQL Server 2008 Services

Microsoft  
**Visual Studio.net**

Microsoft  
**Office**

Microsoft Office  
**SharePoint**  
Portal Server 2003

Third Party  
Apps

Microsoft  
**SQL Server**

Reporting Services

Analysis Services  
OLAP & Data Mining

Notification Services

Data Transformation Services

Replication Services

Relational Database

Management  
Tools

Microsoft  
**Windows Server 2003**



# SQL Server Version History

SQL Server 1.0 (1989)	Developed by Microsoft, Sybase, and Ashton-Tate for OS/2
SQL Server 4.2 (1992)	Developed for Windows NT 3.1
SQL Server 6.0 (1995)	First version architected specifically for Windows NT
SQL Server 7.0 (1999)	Total rewrite of code base resulted in performance and scalability improvements
SQL Server 2000	Further improvements in performance, scalability, and reliability
SQL Server 2005	New and improved features: Integration Services, Analysis Services, Notification Services, Reporting Services, XML support
SQL Server 2008 R2	
SQL Server 2012	
SQL Server 2014	

# SQL Server 2008 Editions

Enterprise

For large scale, business-critical applications

Standard

For small/medium, departmental applications

Workgroup

For small scale, branch applications

Express

Entry level/learning edition

Compact

For embedded databases

Web

For low-end Web hosting

Developer

For development and testing

Evaluation

Trial edition

# SQL Server 2008 **Installation**

# Planning for SQL Server 2008 installation

- ❑ Careful planning is absolutely necessary because several decisions have to be made before the installation of the system is started.

The system administrator should have clear answers to the following questions before beginning the installation process:

- ❑ What is the purpose of the SQL Server system?
  - Educational
  - Production
    - number of users & amount of stored data
    - Is the system used for operational or analytical tasks
- ❑ What are the hardware and network requirements?
- ❑ How many users will be active at the same time?

# SQL Server 2008 Hardware and Software Requirements

## ❑ Hardware

- Pentium III 1GHz processor (32 bit or 64 bit)
- 1GB memory
- 280MB disk space for a minimal install

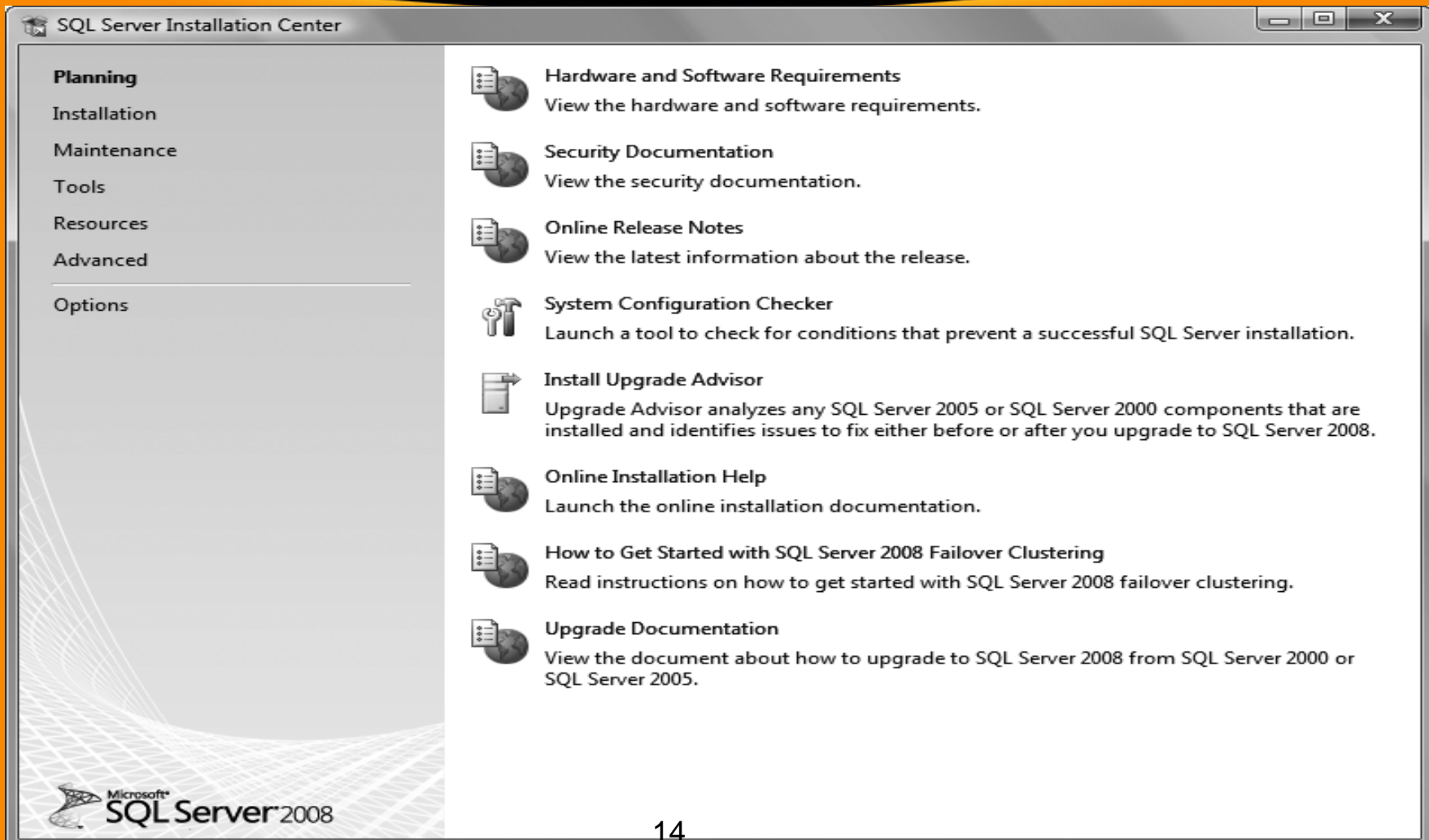


## ❑ Software

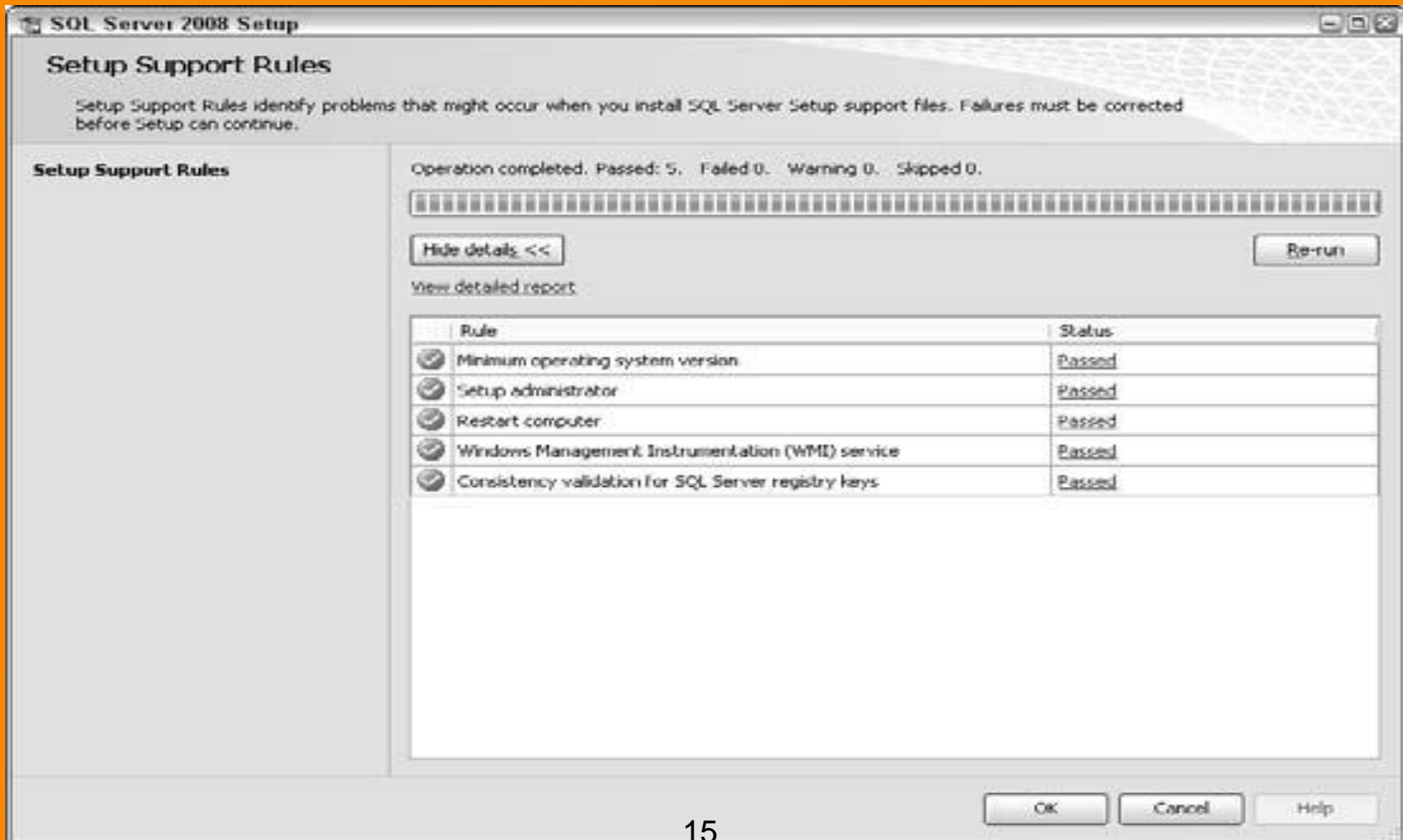
- Windows XP SP2, Windows Server 2003 SP1, Windows Server 2008, Windows Vista , windows 7 ,8,10.
- Windows Installer 3.1 and MDAC 2.8 SP1
- Internet Explorer 6 SP1



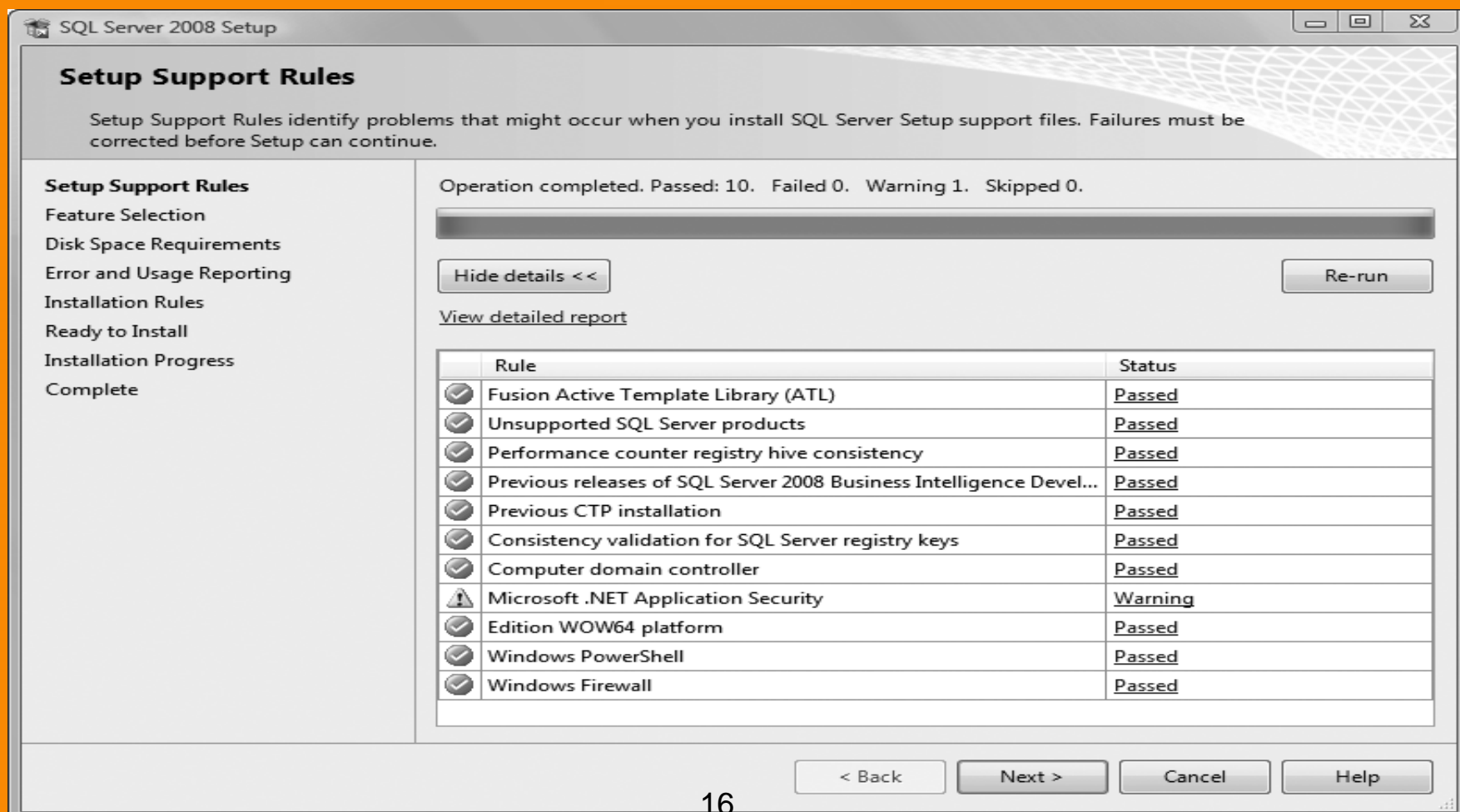
# Ready To Install .. The SQL Server Installation Center



# Results from the system configuration check.



# Results from the Setup Report Rules check



The screenshot shows the 'SQL Server 2008 Setup' window. The 'Setup Support Rules' section is active, displaying a list of rules and their status. The status bar indicates 'Operation completed. Passed: 10. Failed 0. Warning 1. Skipped 0.'.

**Setup Support Rules**

Setup Support Rules identify problems that might occur when you install SQL Server Setup support files. Failures must be corrected before Setup can continue.

**Setup Support Rules**

- Feature Selection
- Disk Space Requirements
- Error and Usage Reporting
- Installation Rules
- Ready to Install
- Installation Progress
- Complete

Operation completed. Passed: 10. Failed 0. Warning 1. Skipped 0.

[Hide details <<](#) [Re-run](#)

[View detailed report](#)

	Rule	Status
✓	Fusion Active Template Library (ATL)	<a href="#">Passed</a>
✓	Unsupported SQL Server products	<a href="#">Passed</a>
✓	Performance counter registry hive consistency	<a href="#">Passed</a>
✓	Previous releases of SQL Server 2008 Business Intelligence Devel...	<a href="#">Passed</a>
✓	Previous CTP installation	<a href="#">Passed</a>
✓	Consistency validation for SQL Server registry keys	<a href="#">Passed</a>
✓	Computer domain controller	<a href="#">Passed</a>
⚠	Microsoft .NET Application Security	<a href="#">Warning</a>
✓	Edition WOW64 platform	<a href="#">Passed</a>
✓	Windows PowerShell	<a href="#">Passed</a>
✓	Windows Firewall	<a href="#">Passed</a>

< Back Next > Cancel Help



# Selecting features for this SQL Server instance

SQL Server 2008 Setup

## Feature Selection

Select the Enterprise Evaluation features to install. For clustered installations, only Database Engine Services and Analysis Services can be clustered.

	Features:	Description:
Setup Support Rules		
<b>Feature Selection</b>		
Instance Configuration		
Disk Space Requirements		
Server Configuration		
Database Engine Configuration		
Analysis Services Configuration		
Reporting Services Configuration		
Error and Usage Reporting		
Installation Rules		
Ready to Install		
Installation Progress		
Complete		
	<b>Instance Features</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Database Engine Services<ul style="list-style-type: none"><li><input checked="" type="checkbox"/> SQL Server Replication</li><li><input checked="" type="checkbox"/> Full-Text Search</li></ul></li><li><input checked="" type="checkbox"/> Analysis Services</li><li><input checked="" type="checkbox"/> Reporting Services</li></ul>	Includes Analysis Services and tools used to support online analytical processing (OLAP) and data mining.
	<b>Shared Features</b> <ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Business Intelligence Development Studio</li><li><input checked="" type="checkbox"/> Client Tools Connectivity</li><li><input checked="" type="checkbox"/> Integration Services</li><li><input checked="" type="checkbox"/> Client Tools Backwards Compatibility</li><li><input checked="" type="checkbox"/> Client Tools SDK</li><li><input checked="" type="checkbox"/> SQL Server Books Online</li><li><input checked="" type="checkbox"/> Management Tools - Basic<ul style="list-style-type: none"><li><input checked="" type="checkbox"/> Management Tools - Complete</li></ul></li><li><input checked="" type="checkbox"/> SQL Client Connectivity SDK</li><li><input checked="" type="checkbox"/> Microsoft Sync Framework</li></ul>	
	<input type="button" value="Select All"/> <input type="button" value="Unselect All"/>	
	Shared feature directory: C:\Program Files\Microsoft SQL Server\	

< Back   Next >   Cancel   Help

# Configuring the SQL Server instance

SQL Server 2008 Setup

## Instance Configuration

Specify the name and instance ID for the SQL Server instance.

Setup Support Rules  
Feature Selection  
**Instance Configuration**  
Disk Space Requirements  
Server Configuration  
Database Engine Configuration  
Analysis Services Configuration  
Reporting Services Configuration  
Error and Usage Reporting  
Installation Rules  
Ready to Install  
Installation Progress  
Complete

☒ Default instance  
☐ Named instance: MSSQLSERVER

Instance ID: MSSQLSERVER  
Instance root directory: C:\Program Files\Microsoft SQL Server\ ...

SQL Server directory: C:\Program Files\Microsoft SQL Server\MSSQL10.MSSQLSERVER  
Analysis Services directory: C:\Program Files\Microsoft SQL Server\MSAS10.MSSQLSERVER  
Reporting Services directory: C:\Program Files\Microsoft SQL Server\MSRS10.MSSQLSERVER

Installed instances:

Instance	Features	Edition	Version	Instance ID
----------	----------	---------	---------	-------------

< Back Next > Cancel Help

# Setting usernames, passwords, and startup options

SQL Server 2008 Setup

## Server Configuration

Specify the configuration.

- Setup Support Rules
- Feature Selection
- Instance Configuration
- Disk Space Requirements
- Server Configuration**
- Database Engine Configuration
- Analysis Services Configuration
- Reporting Services Configuration
- Error and Usage Reporting
- Installation Rules
- Ready to Install
- Installation Progress
- Complete

**Service Accounts** | Collation

Microsoft recommends that you use a separate account for each SQL Server service.

Service	Account Name	Password	Startup Type
SQL Server Agent	NT AUTHORITY\NETWORK SE...		Manual
SQL Server Database ...	NT AUTHORITY\NETWORK SE...		Automatic
SQL Server Analysis S...	NT AUTHORITY\NETWORK SE...		Automatic
Sql Server Reporting ...	NT AUTHORITY\NETWORK SE...		Automatic
SQL Server Integratio...	NT AUTHORITY\NetworkServi...		Automatic

Use the same account for all SQL Server services

These services will be configured automatically where possible to use a low privilege account. On some older Windows versions the user will need to specify a low privilege account. For more information, click Help.

Service	Account Name	Password	Startup Type
SQL Full-text Filter Daemon Laun...	NT AUTHORITY\LOCA...		Manual
SQL Server Browser	NT AUTHORITY\LOCA...		Automatic

< Back   Next >   Cancel   Help

# Provisioning database engine configuration.

The screenshot shows the 'SQL Server 2008 Setup' window, specifically the 'Database Engine Configuration' step. The window title is 'SQL Server 2008 Setup'. The main heading is 'Database Engine Configuration' with a subtitle 'Specify Database Engine authentication security mode, administrators and data directories.' On the left is a navigation pane with the following items: 'Setup Support Rules', 'Feature Selection', 'Instance Configuration', 'Disk Space Requirements', 'Server Configuration', 'Database Engine Configuration' (highlighted), 'Analysis Services Configuration', 'Reporting Services Configuration', 'Error and Usage Reporting', 'Installation Rules', 'Ready to Install', 'Installation Progress', and 'Complete'. The main area has three tabs: 'Account Provisioning' (selected), 'Data Directories', and 'FILESTREAM'. Under 'Account Provisioning', the instruction is 'Specify the authentication mode and administrators for the Database Engine.' There are two radio buttons for 'Authentication Mode': 'Windows authentication mode' (selected) and 'Mixed Mode (SQL Server authentication and Windows authentication)'. Below these are fields for 'Built-in SQL Server system administrator account', 'Enter password:', and 'Confirm password:'. A list box for 'Specify SQL Server administrators' contains 'FAT-BELLY\rdewson (rdewson)'. At the bottom of this list are buttons 'Add Current User', 'Add...', and 'Remove'. A text box on the right states 'SQL Server administrators have unrestricted access to the Database Engine.' At the very bottom of the window are buttons '< Back', 'Next >', 'Cancel', and 'Help'.

SQL Server 2008 Setup

## Database Engine Configuration

Specify Database Engine authentication security mode, administrators and data directories.

Setup Support Rules  
Feature Selection  
Instance Configuration  
Disk Space Requirements  
Server Configuration  
**Database Engine Configuration**  
Analysis Services Configuration  
Reporting Services Configuration  
Error and Usage Reporting  
Installation Rules  
Ready to Install  
Installation Progress  
Complete

Account Provisioning | Data Directories | FILESTREAM

Specify the authentication mode and administrators for the Database Engine.

Authentication Mode

☒ Windows authentication mode  
☐ Mixed Mode (SQL Server authentication and Windows authentication)

Built-in SQL Server system administrator account

Enter password:

Confirm password:

Specify SQL Server administrators

FAT-BELLY\rdewson (rdewson)

SQL Server administrators have unrestricted access to the Database Engine.

Add Current User Add... Remove

< Back Next > Cancel Help

# Reporting Services configuration.

The screenshot shows the 'SQL Server 2008 Setup' window with the 'Reporting Services Configuration' tab selected. The window title is 'SQL Server 2008 Setup'. The main heading is 'Reporting Services Configuration' with the instruction 'Specify the Reporting Services configuration mode.' Below this, there is a list of setup steps on the left, including 'Setup Support Rules', 'Feature Selection', 'Instance Configuration', 'Disk Space Requirements', 'Server Configuration', 'Database Engine Configuration', 'Analysis Services Configuration', 'Reporting Services Configuration' (which is highlighted), 'Error and Usage Reporting', 'Installation Rules', 'Ready to Install', 'Installation Progress', and 'Complete'. The main area on the right contains three radio button options for configuration mode. The first option, 'Install the native mode default configuration.', is selected. Its description states that the report server will be installed in Native mode with default values and is usable immediately. The second option, 'Install the SharePoint integrated mode default configuration.', describes creating the report server database in SharePoint integrated mode, noting that full integration requires a minimal SharePoint installation. The third option, 'Install, but do not configure the report server.', describes installing the software without configuration, allowing for later setup using the Reporting Services Configuration tool. At the bottom right, there are four buttons: '< Back', 'Next >', 'Cancel', and 'Help'.

SQL Server 2008 Setup

**Reporting Services Configuration**  
Specify the Reporting Services configuration mode.

Setup Support Rules  
Feature Selection  
Instance Configuration  
Disk Space Requirements  
Server Configuration  
Database Engine Configuration  
Analysis Services Configuration  
**Reporting Services Configuration**  
Error and Usage Reporting  
Installation Rules  
Ready to Install  
Installation Progress  
Complete

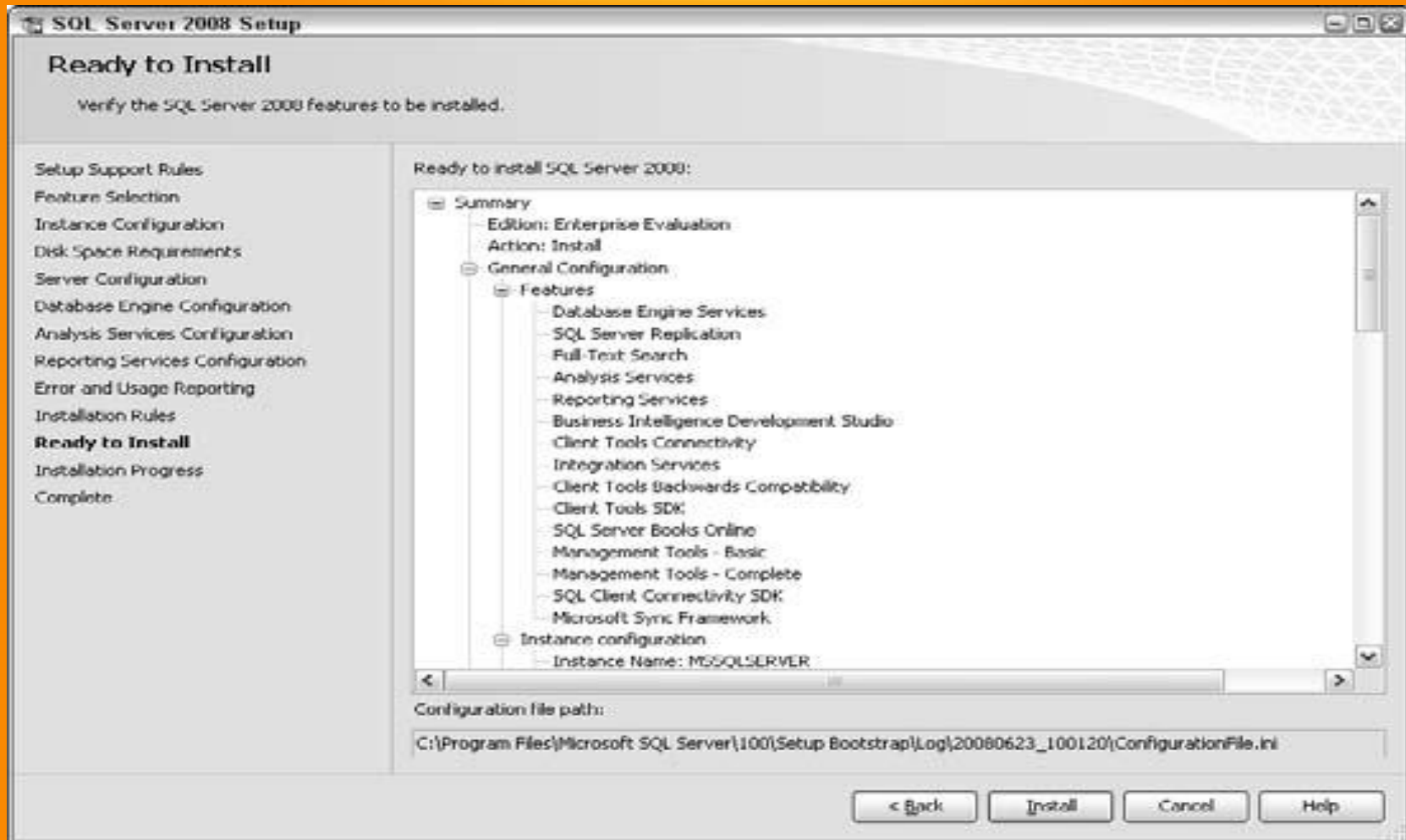
☒ Install the native mode default configuration.  
Setup will install the report server and configure it in Native mode to use the default values. The report server is usable as soon as Setup is finished.

☐ Install the SharePoint integrated mode default configuration.  
Setup will create the report server database in SharePoint integrated mode and configure the report server to use the default values. However, integrated operations will not be supported until a minimal installation of a SharePoint product or technology is deployed on the report server computer and the Reporting Services Add-in for SharePoint Technologies is installed and configured on the instance of the SharePoint product or technology you are using.

☐ Install, but do not configure the report server.  
Setup will install, but will not configure, the report server software. After installation is finished, you can use the Reporting Services Configuration tool to set options that are required to run the report server.

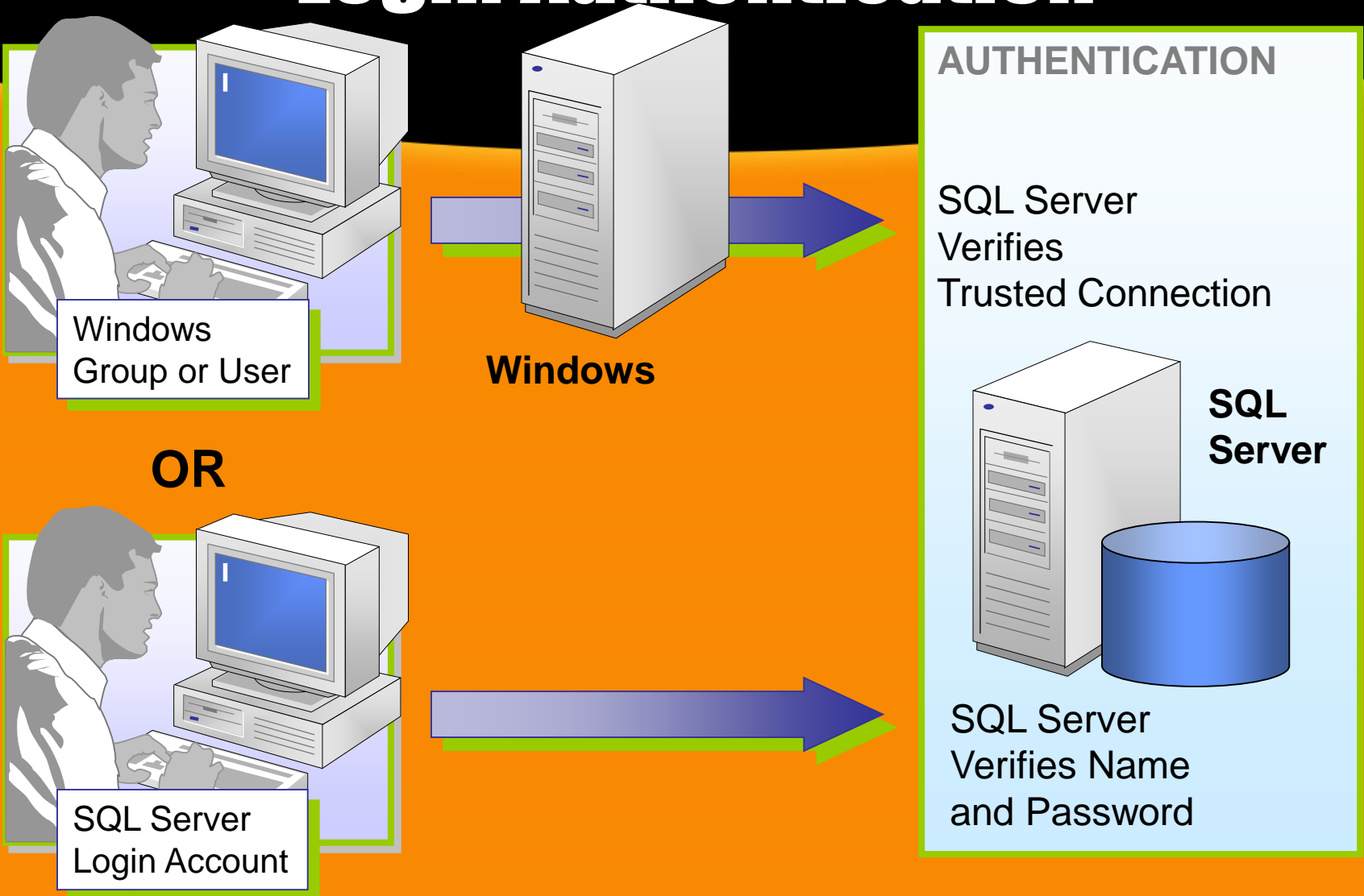
< Back   Next >   Cancel   Help

# Viewing selected features and options.





# Login Authentication



# Connecting to SQL Server



Connect to Server

Microsoft® SQL Server® 2008 R2

Server type: Database Engine

Server name: .

Authentication: Windows Authentication

User name: smsm-PC\smsm

Password:

☐ Remember password

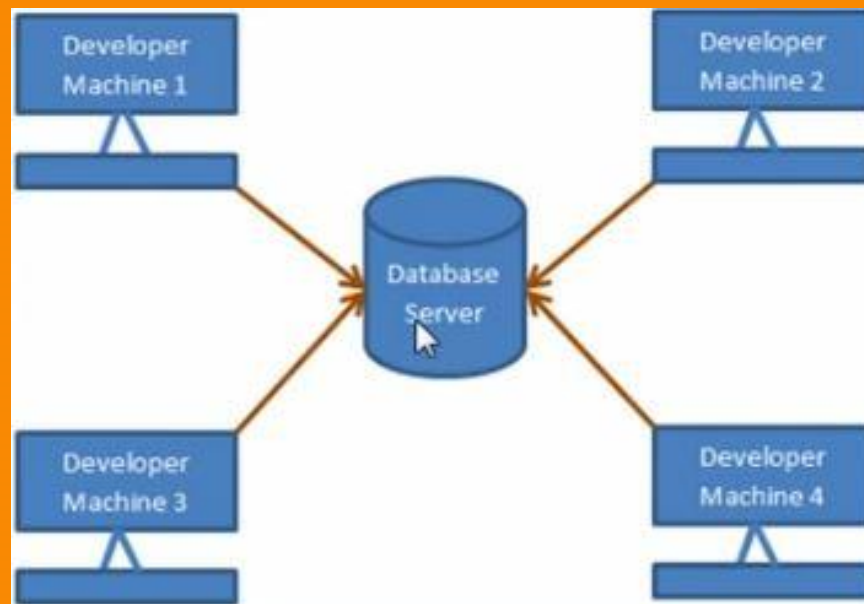
Connect Cancel Help Options >>

- ☐ Server Type: Database Engine.
- ☐ Server name:
  - 127.0.0.1
  - (Local)
  - .
- ☐ Authentication:
  - windows
  - sql server (user name & password)



# SSMS

❑ SSMS is a client tool not a server.



➤ Developer machines connect to sql server using SSMS.

# Creating and altering database

## ❑ SQL server database can be Created, altered and dropped

- GUI using SSMS.
- Using Query.

## ❑ Creating database query

- Create database db\_name
- Two files are created
  - .mdf file: data file (contains actual data).
  - .ldf file : transaction log file (used to recover database).

## ❑ Altering database

- Alter database db\_name modify name=new\_Dbname
- Sp\_renameDB oldDB\_name , newDB\_name

# Deleting or Dropping a database

- ❑ To Delete or drop a DB

  - *Drop database db\_name*

- ❑ Dropping a DB, deletes the LDF and MDF files.

- ❑ If DB is currently in use it can not be dropped. An error will appear.

- ❑ Error will appear if another user is connected to DB. It should be put in single user mode then drop the DB.

  - *Alter database db\_name set single\_user with rollback immediate*

- ❑ With rollback immediate option, all in complete transactions will be rollback and open connections will be closed.

- ❑ Note: system databases(e.g. master) cannot be dropped.

# Creating tables

❑ Tables can be created using

- GUI.
- Using SQL query.

```
CREATE TABLE table_name  
(  
  column_name1 data_type(size) constraint_name,  
  column_name2 data_type(size) constraint_name,  
);
```

```
CREATE TABLE Persons  
(  
  PersonID int,  
  LastName varchar(255),  
  FirstName varchar(255),  
  Address varchar(255),  
  City varchar(255)  
);
```

- SQL constraints: can be specified when the table is created or after the table is created (ALTER TABLE statement).
  - NOT NULL
  - PRIMARY KEY
  - CHECKDEFAULT
  - >UNIQUE
  - >FOREIGN KEY

# UNIQUE Constraint

- ❑ Uniquely identifies each record in a database table.
- ❑ The UNIQUE and PRIMARY KEY constraints both provide a guarantee for uniqueness for a column or set of columns.
- ❑ PRIMARY KEY constraint automatically has a UNIQUE constraint defined on it.
- ❑ Note that you can have many UNIQUE constraints per table, but only one PRIMARY KEY constraint per table.

```
CREATE TABLE Persons (  
  P_Id int NOT NULL,  
  LastName varchar(255) NOT NULL,  
  City varchar(255),  
  CONSTRAINT uc_PersonID UNIQUE (P_Id,LastName)  )
```

```
ALTER TABLE Persons  
DROP CONSTRAINT uc_PersonID
```

```
ALTER TABLE Persons  
ADD UNIQUE (P_Id)
```

```
ALTER TABLE Persons  
ADD CONSTRAINT uc_PersonID UNIQUE  
(P_Id,LastName)
```

# PRIMARY KEY Constraint

- ❑ Uniquely identifies each record in a database table.
- ❑ Must contain UNIQUE values.
- ❑ Cannot contain NULL values.
- ❑ Most tables should have a primary key.
- ❑ A table can have only ONE primary key.

```
CREATE TABLE Persons (  
  P_Id int NOT NULL PRIMARY KEY,  
  LastName varchar(255) NOT NULL,  
  City varchar(255) )
```

```
ALTER TABLE Persons  
ADD PRIMARY KEY (P_Id)
```

```
CREATE TABLE Persons (  
  P_Id int NOT NULL,  
  LastName varchar(255) NOT NULL,  
  FirstName varchar(255),  
  Address varchar(255),  
  City varchar(255),  
  CONSTRAINT pk_PersonID PRIMARY KEY  
  (P_Id,LastName) )
```

```
ALTER TABLE Persons  
ADD CONSTRAINT pk_PersonID PRIMARY  
KEY (P_Id,LastName)
```

```
ALTER TABLE Persons  
DROP PRIMARY KEY
```

# FOREIGN KEY Constraint

- Used to enforce database integrity.
- Foreign key in one table points to a primary key in another table.
- Foreign key constraint prevents invalid data being inserted into the foreign key column.
- The values that you enter into the foreign key column has to be one of the values contained in the table it points to (no null).

```
CREATE TABLE Orders (  
O_Id int PRIMARY KEY,  
OrderNo int NOT NULL,  
P_Id int FOREIGN KEY REFERENCES Persons(P_Id)  
)
```

```
ALTER TABLE Orders  
ADD CONSTRAINT fk_PerOrders  
FOREIGN KEY (P_Id)  
REFERENCES Persons(P_Id)
```

```
CREATE TABLE Orders (  
O_Id int,  
OrderNo int NOT NULL,  
P_Id int,  
PRIMARY KEY (O_Id),  
CONSTRAINT fk_PerOrders FOREIGN KEY (P_Id)  
REFERENCES Persons(P_Id) )
```

```
ALTER TABLE Orders  
DROP CONSTRAINT fk_PerOrders
```

# Default constraint

- ❑ The DEFAULT constraint is used to insert a default value into a column if no other value is specified.

```
CREATE TABLE Persons  
(  
Id int NOT NULL,  
LastName varchar(255) NOT NULL,  
FirstName varchar(255),  
Address varchar(255),  
City varchar(255) DEFAULT 'Tanta'  
)
```

```
ALTER TABLE Persons  
ADD CONSTRAINT DF_persons_city  
DEFAULT 'Tanta' FOR COLUMN City
```

```
ALTER TABLE Persons  
Drop CONSTRAINT DF_persons_city
```



# CHECK Constraint

- ❑ Used to limit the value range that can be placed in a column.
- ❑ A CHECK on a single column allows only certain values for this column.
- ❑ A CHECK on a table it can limit the values in certain columns based on values in other columns in the row.

```
CREATE TABLE Persons (  
  P_Id int Primary Key,  
  FirstName varchar(255),  
  Address varchar(255),  
  City varchar(255),  
  CHECK (P_Id>0) )
```

```
CREATE TABLE Persons (  
  P_Id int Primary Key,  
  FirstName varchar(255),  
  Address varchar(255),  
  City varchar(255),  
  CONSTRAINT chk_Person CHECK (P_Id>0  
    AND City='Sandnes') )
```

```
CREATE TABLE Persons (  
  P_Id int Primary Key CHECK (P_Id>0),  
  FirstName varchar(255),  
  Address varchar(255),  
  City varchar(255) )
```

```
ALTER TABLE Persons  
ADD CONSTRAINT chk_Person CHECK (P_Id>0  
AND City='Sandnes')
```

```
ALTER TABLE Persons  
Drop CONSTRAINT chk_Person
```